ABSTRACT OF THE DISCLOSURE

The present invention is directed to several inventive methods for characterizing implant profiles. In one embodiment, the method comprises forming a first plurality of implant regions in a substrate, and illuminating the implant regions with a light source in a

5   scatterometry tool, the scatterometry tool generating a trace profile corresponding to an implant profile of the illuminated implant regions. In another embodiment, the method comprises measuring profiles of implant regions by forming a plurality of implant regions in a substrate, illuminating the implant regions, measuring light reflected off the substrate to generate a profile trace for the implant regions, comparing the generated profile trace to a

10   target profile trace from a library, and modifying, based upon a deviation between the generated profile trace and the target profile trace, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates. In yet another embodiment, the generated profile trace is compared or correlated to at least one of a plurality of calculated profile traces stored in a library, each of which has an associated implant region

15   profile, and modifying, based upon the comparison of the generated profile trace and the calculated profile trace, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates.